WHAT IS CLAIMED IS:

1. A video coding apparatus for coding a video picture by the use of motion compensatory prediction of each of video pictures with respect to sequentially input video signals, the video coding apparatus comprising:

inter-frame variance calculation means for calculating a variance between timewise adjacent input video signals with respect to the input video signals; and

intra-frame coding mode decision means for deciding an intra-frame coding mode without using any motion compensatory prediction based on the variance, a GOP boundary position being decided based on the decision by the intra-frame coding mode decision means.

2. A video coding apparatus for coding a video picture by the use of motion compensatory prediction of each of video pictures with respect to sequentially input video signals, the video coding apparatus comprising:

one-way coding (P) frame interval decision means for deciding a P frame interval for carrying out motion compensatory prediction coding based on the features of the input video pictures, the P frame interval inside a GOP being decided based on the decision by the P frame interval decision means.

3. A video coding apparatus for coding a video picture by the use of motion compensatory prediction of each of video pictures with respect to sequentially input video signals, the video coding apparatus comprising:

inter-frame variance calculation means for calculating a variance between timewise adjacent input video signals with respect to the input video signals;

intra-frame coding mode decision means for deciding an intra-frame coding mode without using any motion compensatory prediction based on the variance; and

one-way coding (P) frame interval decision means for deciding a P frame interval for carrying out motion compensatory prediction coding based on the features of the input video pictures,

a GOP boundary position being decided based on the decision by the intra-frame coding mode decision means, and the P frame interval inside a GOP being decided based on the decision by the P frame interval decision means.

4. A video coding apparatus according to claim 1, wherein the intra-frame coding mode decision means selects an intra-frame coding mode when the inter-frame variance exceeds a predetermined threshold value.

5. A video coding apparatus according to claim 3, wherein the intra-frame coding mode decision means selects an intra-frame coding mode when the inter-frame variance exceeds a predetermined threshold value.

6. A video coding apparatus according to claim 1, wherein the inter-frame variance is calculated by using at least one of an absolute difference between the input video pictures and a pixel dispersion value of each of small blocks, into which the input video picture is divided.

7. A video coding apparatus according to claim 3, wherein the inter-frame variance is calculated by using at least one of an absolute difference between the input video pictures and a pixel dispersion value of each of small blocks, into which the input video picture is divided.

8. A video coding apparatus according to claim 2, wherein the P frame interval decision means divides the input video picture into small blocks and carries out simple motion compensatory prediction by the use of a representative value per small block so as to decide the P frame interval.

9. A video coding apparatus according to claim 3, wherein the P frame interval decision means divides the input video picture into small blocks and carries out simple motion compensatory prediction by the use of a representative value per small block so as to decide the P frame interval.

10. A video coding apparatus according to claim 8, wherein the representative value uses either one of an average inside the small block and a dispersion value inside the small block.

11. A video coding apparatus according to claim 9, wherein the representative value uses either one of an average inside the small block and a dispersion value inside the small block.

12. A video coding apparatus according to claim 2, wherein the P frame interval decision means controls to make the frame interval small in the case where a motion compensatory prediction error is large while controls to

make the frame interval great in the case where the motion compensatory prediction error is small.

13. A video coding apparatus according to claim 3, wherein the P frame interval decision means controls to make the frame interval small in the case where a motion compensatory prediction error is large while controls to make the frame interval great in the case where the motion compensatory prediction error is small.

14. A video coding apparatus according to claim 2, further comprising means for dividing a target video picture into small blocks so as to judge an edge region inside the video picture based on the dispersion value of pixel information on the small block.

15. A video coding apparatus according to claim 3, further comprising means for dividing a target video picture into small blocks so as to judge an edge region inside the video picture based on the dispersion value of pixel information on the small block.

16. A video coding apparatus according to claim 3, further comprising coding complexity prediction means for predicting coding complexity in each coding system based on the feature of the video picture inside the GOP so as to control a coding quantity at the time of coding in consideration of the complexity.

17. A video coding apparatus capable of coding a video picture by either a field structure or a frame structure, the video coding apparatus comprising:

means for discriminating whether each of sequentially input video pictures is an interlaced video picture or a non-interlaced video picture,

the means selecting coding by the field structure if the video picture is an interlaced video picture while the means selecting coding by the frame structure unless the video picture is an interlaced video picture.

18. A video coding apparatus according to claim 17, wherein in order to discriminate whether the input video picture is an interlaced video picture or a non-interlaced video picture, the spacewise correlation of pixels continuous in a vertical direction at an arbitrary position inside the video picture is measured, so that the video picture is discriminated to be an interlaced video picture if the correlation between the same fields is higher than the correlation between different fields.

19. A video coding apparatus according to claim 18, wherein the coding by the field structure is selected in the case where the number of pixels satisfying the conditions expressed by inequalities (1) and (2) below exceeds a predetermined rate of the number of pixels satisfying the inequality (1) in measuring the spacewise correlation of the pixels continuous in the vertical direction:

$$\mathrm{Max}(d(0,-2),d(0,2),d(-1,1)) < \text{threshold value} \quad \ldots (1)$$

$$(\mathrm{Max}(d(0,-2),d(0,2),d(-1,1))+\mathrm{offset})<\mathrm{Min}(d(0,-1),d(0,1)) \quad \ldots (2)$$

wherein, a and b represent pixel position in the vertical

direction, d(a,b) represents an absolute difference between a and b.

20. A video coding apparatus capable of coding a video picture by either a field structure or a frame structure, the video coding apparatus comprising:

means for calculating the correlation between two video pictures with a timewise interval with respect to sequentially input video pictures; and

means for deciding whether the coding is carried out by either a field structure or a frame structure based on the correlation,

the coding by the frame structure being carried out in the case of the higher correlation than a predetermined value while the coding by the field structure being carried out in the case of the lower correlation than it.

21. A video coding apparatus according to claim 20, wherein the means for calculating the correlation between the two video pictures comprises:

means for creating a downscaled plane in consideration of features of sequentially input video pictures; and

means for performing simple motion estimation processing on the downscaled plane, and

wherein the coding by the field structure is selected in the case where a motion compensatory prediction error obtained by the simple motion estimation processing is larger than a predetermined value.

22. A video coding apparatus according to claim 21,

wherein the means for creating the downscaled plane in consideration of the feature of the video picture divides the video picture into small blocks and calculates a deviation per divided small block, the deviation being an element of the downscaled plane.

23. A video coding apparatus according to claim 20, further comprising means for discriminating whether the input video picture is an interlaced video picture or a non-interlaced video picture,

wherein a video picture variance is analyzed, so that the coding by the field/frame structure is selected by detecting the correlation between the two video pictures with respect to only the video pictures which are discriminated to be interlaced video pictures, while the coding by the frame structure is selected with respect to the video pictures which are not discriminated to be interlaced video pictures.

24. A video coding apparatus according to claim 21, further comprising means for discriminating whether the input video picture is an interlaced video picture or a non-interlaced video picture,

wherein a video picture variance is analyzed, so that the coding by the field/frame structure is selected by detecting the correlation between the two video pictures with respect to only the video pictures which are discriminated to be interlaced video pictures, while the coding by the frame structure is selected with respect to

the video pictures which are not discriminated to be interlaced video pictures.

25. A video coding apparatus according to claim 23, further comprising means for switching and setting the interlaced/non-interlaced video pictures,

wherein it is discriminated whether one video picture input first or a plurality of video pictures are interlaced video pictures or non-interlaced video pictures, so that the means for switching and setting the interlaced/non-interlaced video pictures is set based on the discrimination result.

26. A video coding apparatus according to claim 24, further comprising means for switching and setting the interlaced/non-interlaced video pictures,

wherein it is discriminated whether one video picture input first or a plurality of video pictures are interlaced video pictures or non-interlaced video pictures, so that the means for switching and setting the interlaced/non-interlaced video pictures is set based on the discrimination result.

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